

Appln No. 09/901,558
Amdt date February 1, 2006
Reply to Office action of December 1, 2005

Listing of Claims:

1.-58. (Cancelled)

59. (Previously Presented) An analog front end for a digital subscriber line (DSL) modem, the analog front end comprising:

a single-ended receive channel;

a single-ended transmit channel;

a converter configured to convert a differential input signal from a twisted pair telephone line to a single-ended input signal for the receive channel, and convert a single-ended output signal from the transmit channel to a differential output signal for transmission on the twisted pair telephone line;

an automatic gain control having a single-ended input coupled to the single-ended receive channel, and a single-ended output;

a single-ended first filter coupled to the automatic gain control output; and

a single-ended second filter coupled to the transmit channel for filtering the single-ended output signal before conversion to the differential output signal for transmission on the twisted pair telephone line.

60-65. (Cancelled)

66. (Previously Presented) The analog front end of claim 59 wherein the receive channel comprises an amplifier having automatic gain control.

67. (Previously Presented) The analog front end of claim 66 wherein the automatic gain control comprises a variable attenuator configured to attenuate the single-ended input signal.

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68. (Previously Presented) The analog front end of claim 67 wherein the variable attenuator comprises a voltage controlled resistor.

69. (Previously Presented) The analog front end of claim 68 wherein the voltage controlled resistor comprises a field effect transistor.

70. (Previously Presented) The analog front end of claim 69 wherein the field effect transistor comprises a first part coupled to the amplifier, a second part coupled to a bias voltage, and a gate configured to receive a voltage to control the attenuation of the single-ended input signal.

71. (Previously Presented) The analog front end of claim 70 wherein the first part of the field effect transistor comprises a drain and the second part of the field effect transistor comprises a source.

72.-76. (Cancelled)

77. (Previously Presented) An analog front end for a digital subscriber line (DSL) modem, the analog front end comprising:

receive means for receiving a single-ended input signal;

transmit means for transmitting a single-ended output signal;

converter means for converting a differential input signal from a twisted pair telephone line to the single-ended input signal for the receive means, and converting the single-ended output signal from the transmit means to a differential output signal for transmission on the twisted pair telephone line;

an automatic gain control means having a single-ended input means coupled to the single-ended receive means, and a single-ended output means;

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a single-ended first filtering means coupled to the automatic gain control means;
and

a single-ended second filtering means coupled to the transmit means for filtering the single-ended output signal before conversion to the differential output signal for transmission on the twisted pair telephone line.

78.-82. (Cancelled)

83. (Previously Presented) The analog front end of claim 77 wherein the receive means comprises an amplifier having automatic gain control means for controlling gain of the amplifier.

84. (Previously Presented) The analog front end of claim 83 wherein the automatic gain control means comprises variable attenuation means for attenuating the single-ended input signal.

85. (Previously Presented) The analog front end of claim 84 wherein the variable attenuation means comprises a voltage controlled resistor.

86. (Previously Presented) The analog front end of claim 85 wherein the voltage controlled resistor comprises a field effect transistor.

87. (Previously Presented) The analog front end of claim 86 wherein the field effect transistor comprises a first part coupled to the amplifier, a second part coupled to a bias voltage, and a gate configured to receive a voltage to control the attenuation of the single-ended input signal.

88. (Previously Presented) The analog front end of claim 87 wherein the first part of the field effect transistor comprises a drain and the second part of the field effect resistor comprises a source.

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89.-93. (Cancelled)

94. (Previously Presented) A method of interfacing to a twisted pair telephone line in digital subscriber line (DSL) modem, comprising:

- receiving a differential input signal from a twisted pair telephone line;
- converting the differential input signal to a single-ended input signal;
- adjusting the gain of the single-ended input signal;
- filtering the single-ended input signal;
- filtering a single-ended output signal;
- converting the filtered single-ended output signal to a differential output signal;

and

- transmitting the differential output signal over the twisted pair telephone line.

95. (Previously Presented) The method of claim 94 further comprising filtering and amplifying the single-ended output signal.

96. (Previously Presented) The method of claim 94 further comprising filtering and amplifying the single-ended input signal.

97. (Previously Presented) The method of claim 96 further comprising amplifying the single-ended input signal with automatic gain control.

98. (Previously Presented) The method of claim 97 wherein the automatic gain control comprises attenuating the single-ended input signal.

99. (Previously Presented) The method of claim 97 wherein the attenuation is performed with a voltage controlled resistor.

100. (Previously Presented) The method of claim 99 wherein the voltage controlled resistor comprises a field effect transistor.

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101.-110. (Cancelled)